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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • JULY 27, 1946

Prehistoric Head

See Page 52

A SCIENCE SERVICE PUBLICATION

1921 TWENTY-FIFTH ANNIVERSARY 1946

The why of Monsanto Calcium Phosphates

Modern diets — even though rich in vitamins — often do not provide all the calcium and phosphate the body normally needs.

To guard against this possible dietary deficiency, many manufacturers add Monsanto calcium phosphates to flours, breads, cereal foods, salt, and even sugar. This supplies a reserve the body needs, regardless of age or sex. For, calcium phosphate is the principal element the body uses to build bone and tooth structure during infancy and childhood. Also, it is essential throughout adult life, if bones, teeth and tissue are to remain strong and healthy.

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MONSANTO CHEMICAL COMPANY, ST. LOUIS 4

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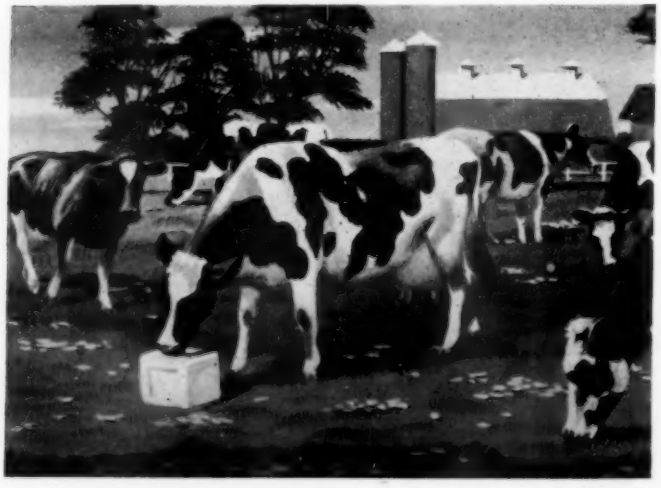
Monsanto's elemental phosphorous, of better than 99.9% purity, is the source of Monsanto's calcium phosphates. These phosphates are pure white, tasteless, odorless.



Animals instinctively choose foods rich in calcium phosphates. That's why livestock thrives when supplied with "salt blocks" fortified with Monsanto calcium phosphate.

Uses of Monsanto Calcium Phosphates

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CALCIUM PHOSPHATE, MONO
CALCIUM PHOSPHATE, DI
CALCIUM PHOSPHATE, TRI
CALCIUM PHOSPHATE, X-C (extra rich in calcium)
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If you manufacture food products or medicinals that can be profitably enriched with calcium phosphates, contact Monsanto... Or, if you have any problem beyond the field of foods, you may find an answer in Monsanto's many hundreds of chemicals and plastics.

ATOMIC ENERGY

Control Fear, Not Fission

Attitudes of people, not control of fissionable materials, are the real problem, atomic energy meeting is told. UNO must stop world's rush for uranium.

➤ IF IT HAS not become apparent as a result of the sessions of the UNO atomic energy commission in New York, the nonofficial and more outspoken atomic energy meeting in Washington has made this clear:

The real problem is not the control of the fission of the plutonium atom, but the control of the attitudes, feelings and emotions of peoples of various nations.

Secretary of Commerce Henry A. Wallace put it this way:

"The immediate purpose of any plan for control of atomic energy is to put an end to the possibility of a state of international hysteria and fear in which other negotiations will become so difficult as to be impossible."

The immediate purpose in Secretary Wallace's view is not to solve the whole problem of war but to avoid the possibility of a surprise war which could kill millions of persons in a night.

Those who continue to prepare for total war in an atomic world in the belief that this is the best security for peace were told by Dr. Norman H. Dawes of Carnegie Institute of Technology that all those who have so believed and acted have shortly found themselves in armed conflict.

"There is an alarming loss of faith for democratic living," he warned the Institute on World Control of Atomic Energy, "and the resultant mental and spiritual climate is not at all assuring to men of good will."

Hungry, desperate, undernourished human beings will fail to comprehend the issues at stake or take those measures for the control of atomic power in which alone there is world security, Dr. Dawes declared.

The power of the nucleus must be used, Dr. Philip Morrison, atomic physicist of Los Alamos, New Mexico, and Cornell University, declared, "to change not only the forces with which we deal but the relations among men themselves."

Secretary Wallace told the institute that "the people cry for new and revolutionary measures to control new and revolutionary dangers," and that "there has been criticism of statesmen and diplomats for being too slow in buckling down to real work on these problems."

There is no doubt, Secretary Wallace continued, that there will be eventual revolutions in our industrial life. But he urged that we must not take a whole generation to realize and act upon the implications of this new age. Because, as he put it, "we simply cannot afford to waste that much time."

A world search for uranium is being carried out on a scale surpassing that of the gold rush of '49.

An international rush for the raw material for atomic bombs and atomic energy is underway even though it is hidden from view, W. A. Higinbotham, chairman of the Federation of American Scientists, told the atomic energy institute.

The UNO atomic energy commission must stop this atomic arms race before it can go about solving other major problems, Mr. Higinbotham warned.

If political and technical controls against the nations of the world making bombs is not achieved, we must to a large extent give up our cities, he declared.

The official U. S. Strategic Bombing Survey issued by the White House and buried under OPA and Bikini news, Mr. Higinbotham said, pictured the nation "running for cover and burrowing like moles so fantastically as to seem almost unbelievable."

Already, Mr. Higinbotham said, nervous people are going to fortune tellers to ask where they will be safe, economic advisers are recommending rural property as safe investments, and bills in Congress to replace the government if destroyed overnight receive serious consideration.

Expressing confidence that people all over the world will support the U. S. proposals for international control if they get the facts, Mr. Higinbotham also said that the attitude of humanity toward war should change because of the atomic bomb menace.

The House Talks on Control

➤ THE McMAHON bill for the control of atomic energy (Sen. 1717) was the principal subject of debate in the House of Representatives last week. Opponents of the bill attempted (1) to kill it outright, (2) to delay matters indefinitely, leaving atomic energy control in the hands of the Army, and (3) to have the bill returned to (*Turn to Page 53*)

NEW RECORD—This AAF R-5 Sikorsky helicopter is holder of the new world's record for long distance flight set at Air Materiel Command, Wright Field, Ohio. It was flown from Wright Field to Boston.

ARCHAEOLOGY

Excavations In Mexico

Enormous stone heads and monuments of mysterious origin discovered. The basalt from which they were made is not native to the section.

See Front Cover

➤ FIVE COLOSSAL stone heads, one frowning and the others placidly viewing the world, have been brought to light in the jungles of southern Mexico.

These newly-discovered great stone heads were found among the remains of a prehistoric Indian ceremonial center excavated this spring by an expedition of the National Geographic Society and the Smithsonian Institution.

"These gigantic heads represent the best group of monuments we have ever found," Dr. Matthew W. Stirling of the Smithsonian Institution, expedition leader, stated upon his return. Although similar to other basalt heads found by the expedition in previous seasons, these found in the archaeological site known as San Lorenzo are better preserved and have finer carvings.

The picture on the front cover of this SCIENCE NEWS LETTER from the National Geographic Society, shows the first colossal head taken out by the expedition. It is classed as a number one head and is one of the two largest, measuring nine feet in length. This head is one of the best made and best preserved of the La Venta type. Dr. Stirling and Dr. Drucker are standing beside the head.

Word that a colossal stone head was in this region reached the expedition at work in Chiapas, through friendly natives. A comparatively new village had grown up in the section, and in cutting a trail, the natives stumbled across a fallen head six to eight inches below the surface. As stone was not often found in this region, the natives curiously scraped off the top soil. A stone eye looked up at them. By the time the expedition reached the site last year, another basalt head had been unearthed by the natives. Several other large ones were located, but no excavation was done at that time.

This spring the expedition unearthed 24 monuments within an area of only a square mile. Some are ten feet high and weigh an estimated 40 or 50 tons; others are little more than life size and weigh but a few hundred pounds. They were all found several miles from the tiny village responsible for their discovery.

None of the gigantic stone heads, however, were in the place they had been set up originally. Succeeding generations of natives who did not regard them with the same awe as their creators had probably rolled them into ravines or hollows to get them out of the way.

Little is known about the history of the gigantic figures or who they represent. Another mystery is how they got to this site along the Rio Chiquito, about 60 miles inland from the Gulf of Mexico. The basalt from which they were carved did not come from that section, but must have been quarried at least 75 miles to the north. The San Lorenzo community is believed to have existed between 500 and 800 A. D. It is one of three major sites representing the La Venta civilization under investigation during the last few years.

Science News Letter, July 27, 1946

MEDICINE

New Better Epilepsy Medicines Coming

➤ NEW AND better medicines for epilepsy are coming, Dr. Jerry C. Price of the Neurological Institute, New York, declared when he appeared as guest of Watson Davis, director of Science Service, on the Adventures in Science program over CBS.

First of the new medicines coming to help the 750,000 epileptics in the nation is mesantoin. This will be on the market soon, Dr. Price stated. It is a sister drug of the hydantoin series which includes phenytoin sodium, commonly known as dilantin. Like dilantin, mesantoin controls convulsions in "grand mal", the big illness epilepsy, but it does not cause swelling of the gums as dilantin does in some patients, especially children.

Next to come as epilepsy remedies may be chemicals of the enzyme class which play important parts in body chemistry. The possibility of using these as epilepsy remedies appears especially significant because they may directly attack the cause of epilepsy, whereas other chemicals only check the convulsions which are a symptom of the disease.

Development of an enzyme attack on epilepsy goes back to the glutamic acid treatment introduced in 1942 by Dr. Price and Drs. Heinrich Waelsch and Tracy J. Putnam at the Neurological Institute. Subsequently, Dr. David Nachmansohn, of Yale, found that glutamic acid was linked to acetylcholine metabolism. Acetylcholine had been previously shown to cause convulsions. Dr. Nachmansohn has since discovered the enzyme and co-enzyme systems of acetylcholine metabolism.

"The chemical structures of these enzymes," Dr. Price said, "indicate the enzyme may be used in the treatment of grand mal and the co-enzyme in the treatment of petit mal types of epilepsy."

Science News Letter, July 27, 1946

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PUBLIC HEALTH

World Health Problems

Health-restoring tasks of World Health Organization include prevention of epidemics, centers for typing disease, and surveys on malaria.

➤ HALF A DOZEN urgent health restoring and perhaps life saving tasks face the World Health Organization now being planned by the United Nations Health Assembly in New York.

Studies of the migrations of infantile paralysis and of fluctuations in the severity of polio epidemics need to be made.

Maps need to be made showing the amount in countries round the world of virus diseases, such as atypical pneumonia and infectious hepatitis, known to the layman as jaundice.

Diseases like diphtheria, dysentery and influenza should be routinely typed in as many centers as possible. The new influenza vaccine gives protection against types A and B 'flu virus, but health authorities need to know, before advising vaccination of a population, whether A, B, or some other type is starting up in epidemic form.

On tuberculosis, venereal diseases and disorders resulting from malnutrition, extensive information must be gathered so authorities will know the problems to be faced and overcome.

New surveys on malaria are needed.

These necessary postwar tasks for preventing epidemics in Europe are outlined by Knud Stowman, chief of UNRRA's epidemiological information service. Reading his report, it is clear that they are the sort of tasks the World Health Organization may be expected to take on, though Mr. Stowman does not himself make that suggestion.

When plans were drawn up for a new international health organization after World War I, he points out, not enough data were available for an exact appraisal of the epidemic situation in the whole of Europe. The situation is much better at present. The records, though in some countries less complete than before the outbreak of World War II, have been put to good use.

"The epidemic situation would certainly have been far worse than it is, and also far more uncomfortable to countries which had to protect themselves," Mr. Stowman declares, had not these records been made available.

"We may go back 300 years to the end of the Thirty Years War to find misery and social chaos comparable to that now prevailing in many parts of Central and East-Central Europe. Even so, material destruction is far greater now than then."

Modern preventive medicine alone, he declares, has prevented a 300-year relapse in the epidemic situation. As it is, the relapse has been to 50 years ago, when diphtheria and typhoid fever dominated and tuberculosis was epidemic.

Science News Letter, July 27, 1946

AERONAUTICS

Supersonic Flight Suit

➤ A PRESSURE suit that will support life in a vacuum and allow for complete mobility has been developed by the Army Air Forces for high-altitude, supersonic flight. The new suit will be available in two years, Brig. Gen. Malcolm C. Grow, air surgeon for the AAF and inventor of the famous flak suit used in World War II, predicted.

Gen. Grow said the new suit was designed to protect airmen from possible rupture of pressurized cabins at extremely high altitudes. He said that the ultimate development for safe escape from high speed planes at high altitude would be a pressurized cabin or capsule that can be ejected with the person inside. This capsule would have its own parachute.

Tests have shown, he reported, that airmen can be forcibly ejected from a plane only up to a maximum speed of 450 miles per hour. After that, the human body cannot withstand the terrific pressure of the air.

Identifying future high-speed planes will pose another problem, the air surgeon said. He announced that tests are now being made with films at the School of Aviation Medicine, Randolph Field, Tex., to determine how fast a plane can be identified by the human eye. The films show a plane flying at 350 miles per hour and are stepped up to 1400 mph.

Describing the difficulties encountered in developing new equipment for changing conditions, Gen. Grow cited the light-weight AAF flak helmet as an example of improved equipment for protecting airmen. The flak helmet, using cold-rolled manganese steel instead of the heat process used in the M-1 infantry helmet, was produced only after many months of study, he said.

Science News Letter, July 27, 1946

ANIMAL NUTRITION

Corn Tassels Good Feed For Poultry, Livestock

➤ CORN TASSELS, normally discarded after being clipped from plants in producing seed for hybrid corn, make excellent feed for poultry and livestock.

Tassels taken just before pollen begins to shed contain approximately 12 times the vitamin A, eight times the vitamin B_2, twice the vitamin B_1, three times the niacin and three times the pantothenic acid potency of corn kernels. The protein level is also almost twice that of corn, J. M. Van Lanen, F. W. Tanner, Jr., and Shirley E. Pfeiffer of the U. S. Department of Agriculture discovered by analyzing tassels at the Northern Regional Research Laboratory in Peoria, Ill.

Although tassels comprise a relatively small part of the corn plant, an acre of corn planted for hybrid seed production is estimated to yield around 270 pounds of dry tassels. Thousands of tons of feed material could be saved each year by collecting these tassels that, in producing hybrid corn, must be removed before the pollen begins to shed.

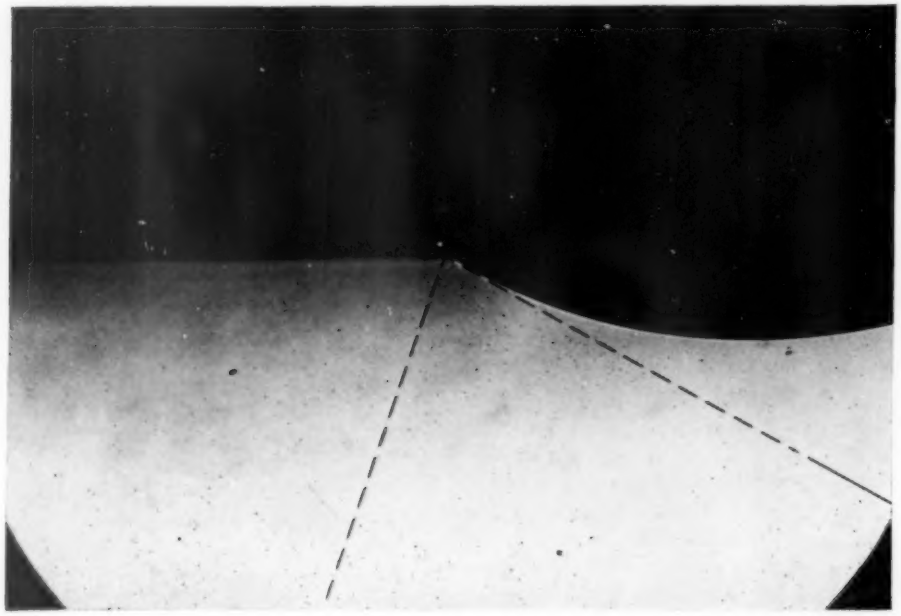
Science News Letter, July 27, 1946

From Page 51

the House Committee on Military Affairs for further consideration. None of these attempts succeeded.

Ten amendments were voted. Their general effects are: (1) to increase the weight of military representation on the Control Commission, (2) to relax somewhat the provisions for government ownership of all patents pertaining to the production of atomic energy, and (3) to increase security precautions. The amended bill went to a conference committee of the Senate and House.

Science News Letter, July 27, 1946



ANOTHER ANGLE—Image of a drop of water as seen through goniometer eyepiece. Cross hair measures contact angle of the edge of the drop as it stands on an oil-protected surface of steel.

MEDICINE

Vitamin E for Purpura

➤ SUCCESS IN vitamin E treatment of purpura is reported by Drs. Floyd Skelton, Evan Shute, H. G. Skinner and R. A. Waud, of the University of Western Ontario.

Purpura is a relatively rare and sometimes fatal disorder in which purple patches appear on the skin because of hemorrhage and accumulation of blood under the skin. A tendency to bleed easily is another symptom, though the disease is not identical with hemophilia. The cause in most cases is unknown, though one form of purpura may come from certain drug intoxications. For some patients, removal of the spleen has brought about recovery.

Among the five patients helped by the vitamin E treatment, one had already had the spleen removed without being helped by this surgical measure. Besides these five, the doctors report great clinical improvement in one man in the last stages of purpura and aplastic anemia associated with advanced lymphosarcoma, a cancerous disease.

Three women who bruised easily and suffered from excessive uterine bleeding were also helped.

The effect of the vitamin E treatment appeared within one to two weeks, but the treatment must be continued for long periods, if not indefinitely.

The report of this work, appearing in the American scientific publication *Science* (June 28), follows closely a report in the British publication, *Nature* (June 8), of Dr. Shute and associates of success with vitamin E in treatment of one form of heart disease.

This vitamin has been popularly known as an anti-sterility or fertility vitamin because in rats, at least, it is essential for reproduction.

Science News Letter, July 27, 1946

CHEMISTRY

Steel-Protecting Oils Tested With Water Drop

➤ THE ANGLE made by the edge of a drop of water, on a surface protected against rusting by oil, is being used to determine the value of the coating as a rust preventive, scientists of the Shell Oil Company state.

The method was devised by them, and they claim it to be a quick and reliable way to determine the effectiveness of rust protection oils.

When a drop of water is put on an oil-coated metal surface, it may remain nearly spherical flattened only on the under side, or it may flatten out broadly. Laboratory tests, the scientists say, show that it flattens out more on a coating of good rust-preventive oil than it does on oil coatings of poor protection.

The more the drop of water flattens the smaller is the angle made by its upper surface with the base on which it rests. An angle of five to ten degrees means that the coating will probably give protection four times as long as when the angle is from 50 to 55 degrees.

To measure the angle, a special microscope is used. There are other factors in rust-protection oils that must be taken into consideration. This method, however, is a rapid simple control test in the formulation of oil protective coatings.

Science News Letter, July 27, 1946

ORDNANCE

Silent "Machine-Gun" Built in Laboratory

➤ A SILENT "machine-gun" built from electronic apparatus used in radios aided wartime research on the temperatures of gun barrels during firing.

The electronic device which simulated a machine-gun and fired over long ranges without noise was fitted with simple electrical meters to record the temperatures at different rates of firing.

Precise information to allow longer life and greater firing accuracy for actual machine-guns was obtained by using the device, Dean M. P. O'Brien of the College of Engineering, University of California, reported.

Science News Letter, July 27, 1946

MEDICINE

Penicillin To Save Unborn Babies From Syphilis

➤ BABIES THAT get syphilis before they are born will be cured before they are born by means of penicillin, if expectations of Dr. John H. E. Woltz and Miss Marjorie M. Wiley, of the University of Pennsylvania School of Medicine, are fulfilled.

Penicillin given to the mother reaches the unborn baby with its syphilis-healing power as early as the tenth week after conception, these scientists report in the *Journal of the American Medical Association* (July 27).

Arsenical drugs previously used to treat syphilis in adults and in babies before birth does not, so far as is known, reach the unborn baby's body before the latter half of pregnancy. Even then not enough of the drug may reach the baby to cure syphilis.

Science News Letter, July 27, 1946

ENGINEERING

Plans for Safer Living

Engineers prove that oxygen pumped into water aids purification; same wind-resistance principle applies to bridges and planes; more and better highways needed.

▶ PUMPING AIR into polluted rivers aids purification, the American Society of Civil Engineers meeting in Spokane was told by Prof. Richard G. Tyler of the University of Washington.

He cited the successful experiments of the past three summers at Park Falls, Wisc., where one and a half tons of oxygen a day was discharged into the waters of the Flambeau river. The result was shortening "to a considerable degree the length of stream utilized for the oxidation of the waste," he said, and it served to prevent nuisances caused by bacteria.

"Experience indicates," he said, "that the stream is a more efficient purification plant than presently used artificial methods of treatment." But, he added, the process is too slow for practical application unless air is added to the water to supplement the functioning of sewage treatment plants.

Prof. Tyler declared the natural methods of self-purification of streams, "which have been so important in conserving their waters for the use of mankind, may be reinforced efficiently and economically by stream reaeration," and expressed the hope that "further large-scale applications of this process will be welcomed by state and federal authorities."

Build for Wind Pressure

Airplanes and suspension bridges seem to the layman to have little in common, but engineers now state that the same principles used by aircraft makers in decreasing wind resistance can be applied to suspension bridge construction.

The principle, three experts told the meeting, is virtually identical whether applied to the plane or a bridge. The objective in bridge designing is to eliminate wind pressure, in the same manner as the plane makers have done away with wing flutter.

The three engineers reported on an investigation by them of the recent failure of the Tacoma Narrows suspension bridge which they made to secure information on how to make suspension structures safe throughout a normal lifetime. They are Prof. F. B. Farquharson of the University of Washington, and C. E. Andrew and Dexter R. Smith, engineers of the Washington Toll Bridge Authority.

The Tacoma Narrows bridge failed because of constant oscillation in the winds prevailing in the section. It virtually "shook itself" to pieces, the engineers said. With the help of wind-tunnel studies, they have designed a bridge that they feel will be safe.

Their studies have convinced them, they declared, that investigations of winds as they exist may well become very important in the preliminary design studies of every suspension bridge, and will be a major control of the type of structure to be used.

Millions Needed for Roads

From $16,000,000,000 to $20,000,000,000 will be required to modernize the present highway system to accommodate present traffic, Charles Upham of the American Road Builders' Association told the Society.

The highway appropriation for 1946 should approximate $750,000,000, and reach $2,000,000,000 by 1949, and then continue at that level, he believes. It would be financed by gasoline and other taxes paid by highway users.

"In the years before the war the highway users paid into the government agencies in highway user taxes approximately $2,240,000,000 per year," he stated. "With the additional ten to fifteen million new cars coming on the highways and the pent up desire of everyone to get out on the road again, the gasoline taxes collected by the state and federal governments would amply finance the cost of all new highway construction if it were all used for that purpose."

A heavy road building program is needed also to keep general economical conditions at a high level. For every dollar spent in road construction by modern methods, three dollars worth of business results, he asserted. For every man employed on the road building job, 1.7 are employed in the industries that furnish materials and equipment.

The full public construction program, including roads, buildings and other projects, should be adjusted, Mr. Upham said, to keep the total construction always above 12% of the national income. "During the '20's, full employment and prosperous conditions existed when construction volume exceeded 12% of the national income. Unemployment occurred when the volume went below this figure."

Science News Letter, July 27, 1946

INVENTION

Ball and Socket Joint Compensates for Own Wear

▶ BALL AND socket joints, important to users of many kinds of machines, will no longer need frequent replacement if a new joint recently patented lives up to expectations. It is called an automatic wear-compensating joint, the wear being compensated for by a tapering pin that spreads the two halves of the ball.

This ball of the joint is in two semi-spherical parts with curved inner surfaces that form a tapering bore to hold the tapering pin. The smaller end of the pin, projecting through the socket, holds a nut behind which is a spring. The spring tends to draw the pin tighter into the bore, and does so if there is any wear on the outside of the ball or the inside of the socket. This expands the sections of the ball, causing them to fit closely into the socket. A special system of lubrication helps reduce wear.

The patent number for this joint is 2,401,814 and it was awarded to Paul B. Burhans of Fort Myers, Florida.

Science News Letter, July 27, 1946

PHOTOGRAPHY

High Contrast Film For Television Movies

▶ BETTER TELEVISION pictures will result from use of a new du Pont motion picture film which carries an emulsion to obtain more detail in both highlights and shadows of outdoor scenes.

To save processing time and demonstrate the flexibility of handling of news pictures over a television system, the new film is used in negative form. A positive picture will appear on television screens. Since the picture is reversed as it passes through each stage of signal amplification in the television system, it is only necessary to have an odd number of amplification stages to end up with a positive picture on the screen.

Science News Letter, July 27, 1946

ENGINEERING

Noisy Air Hammer Replaced by Flame

➤ NO LONGER NEED a neighborhood be disturbed by the deafening noises of the air compressor cutting away pieces of concrete in street or sidewalk. A flux-forming fuel, and method of use, patented recently, permits a noiseless process. While it is particularly applicable in piercing round deep blasting holes in concrete and hard iron ore, it can be used to make grooves or cuts in the mineral materials.

The flux is a mixture of free-flowing finely pulverized materials, fed continuously into the blowpipe flame of an oxygen burner. It is composed of varying quantities of iron, manganese, silicon, aluminum, and either zirconium or calcium. A convenient way to get the mixture is to use ferromanganese, zirconium-silicon alloy, and aluminum, all in finely divided form. Calcium-silicon alloy can replace the zirconium alloy in whole or in part.

This mixture, when burned in gaseous oxygen, provides much heat. It forms oxides with the materials being cut, and these are in the form of a highly fluid slag. The gaseous products of combustion force the slag from the hole.

Patent 2,402,947 was granted Charles J. Burch, Plainfield, N. J., for this invention. It has been assigned to the Linde Air Products Company.

Science News Letter, July 27, 1946

MEDICINE

New Treatment for Glaucoma Stops Pain

➤ A NEW, PAIN-RELIEVING treatment for acute glaucoma, disease responsible for a large proportion of blindness, is arousing enthusiasm among eye specialists in this country and in Mexico.

The treatment was developed independently and at almost the same time by Dr. Manuel Jose Icaza, of Mexico City, and Dr. J. M. Levitt, of Brooklyn, N. Y., who has just finished almost four years of Army service.

The treatment consists in injecting an anesthetic solution into the region behind the eyeball. This blocks the sensory nerves of the eye, preventing their carrying pain messages. Before and after the injection, solutions of pilocarpine and physostigmine are dropped into the eye and epinephrine is injected with the local anesthetic.

As a result, the pain disappears completely and all signs of too great tension in the eye rapidly and completely disappear. The opacity of the cornea, caused by swelling, clears up, the pupil contracts strongly under the effect of the drops given before and after the injection, the redness of eyelids and eye goes away, the eye softens and in some cases the visual power improves and the field of vision is enlarged. Whether these effects on eyesight occur depends on how much permanent damage to vision has taken place.

Besides giving the patient relief from great pain, this treatment puts the eye into perfect condition for operation and allows the surgeon to plan the best operation for each case and to perform it at exactly the right time, instead of having to do an emergency operation under conditions more likely to lead to failure than success.

Dr. Icaza does not believe this treatment is a remedy for glaucoma. He considers it the most useful palliative yet found. He has used it successfully on more than 200 patients in the past five years.

The method of injecting an anesthetic into the tissues at the back of the eye socket has long been standard practice for operations on the eye.

Science News Letter, July 27, 1946

ASTRONOMY

World Chain of Coronographs

➤ A WORLD-WIDE chain of telescopic coronographs, permitting the antics of the sun to be watched at all times as if there were a perpetual eclipse, may result from the visit of Dr. Bernard Lyot to this country. The coronograph is the invention of Dr. Lyot, famous French astronomer.

Such continuous eclipse observations will help considerably in making radio forecasts and in foretelling what will happen to the weather.

Starting at Harvard Observatory, Dr. Lyot will visit all the large observatories in the United States and Canada, including the Climax, Colo., station of Harvard, 11,500 feet above sea level, where is located the only coronograph in America. He will test seeing conditions at each of the observatories to compare with conditions on the Pic du Midi, high mountain in southern France, where he observed with his coronograph throughout the war despite the German occupation.

Science News Letter, July 27, 1946

IN SCIENCE

INVENTION

Tin-Plating Sheet Metal By Electricity

➤ TIN PLATING of sheet metal, to be used in making the familiar "tin cans" and for other purposes, was carried out for years by the so-called dipping process. During the war a process of applying the tin in an electrolytic bath was developed and used largely because a thinner coat could be applied and less of the critical metal used. A patent, 2,402,185, on one electroplating composition and process has been granted to Ernest W. Schweikher, Shaker Heights, Ohio, assignor to the E. I. du Pont de Nemours and Company, Wilmington, Del.

For electroplating, compositions in which the tin is in a stannous compound are found satisfactory but these compounds are not stable or, if dry, become partly insoluble in storage. This patent is given for a mixture of stannous tin and smaller quantities of other chemicals that increase stability and produce no undesirable effects upon the tin deposits. A dry composition included is 66% stannous chloride and 33% sodium fluoride, the remainder being equal amounts of potassium ferri-cyanide and sodium thiocyanate.

Science News Letter, July 27, 1946

RESEARCH

Acetylene Plastic Wins Stalin Prize

➤ PLASTICS developed from acetylene have won a Stalin prize award for Dr. Ivan Nazarov, director of the organic chemistry laboratory of the Academy of Sciences Institute in Moscow.

A pupil of the late Russian chemist Favorsky, Dr. Nazarov has developed a number of organic compounds in the vinylacetylene series. Among these compounds is the base for strong glues used to join glass, plastics, woods, metals, stones and other solids.

He produced transparent resins by polymerization of ethers, esters and glycols produced during the condensation of vinylacetylene with ketospirits, and has conducted research on organic compounds.

Science News Letter, July 27, 1946

E FIELDS

RADIO

Radio "Hum" Attributed To Interstellar Space

➤ RADIO SIGNALS received from outer space on the wavelengths around five meters are attributed to interplay of free electrons in interstellar space, not blasts of radiations in the distant stars.

The latest discussion of origin of the mysterious radio "hum" of the universe, that received some attention following the radar echoes from the moon, is contained in a report to the London science journal, *Nature* (June 15), from astronomers of the Yerkes Observatory of the University of Chicago, Drs. J. L. Greenstein, L. G. Henyey, and P. C. Keenan.

The sun is known to send out radio frequency radiation in connection with sunspot activity. This caused the suggestion that the radiation of a similar sort from interstellar space might be due to a sort of symphony of similar radiation from a great multitude of stars throughout the universe.

Computations made by the American astronomers show that this source of radiation would produce an intensity much lower than that actually received on special radio receivers tuned to the outer universe. They conclude the origin is truly in the space between the stars.

Science News Letter, July 27, 1946

SAFETY

Army Life Raft Suitable For Commercial Planes

➤ ODD APPEARING life rafts, developed by the Army, bear little resemblance to any ever seen before. Their unusual shapes give them their names, the "Wheel" and the "Covered Wagon." A particular feature is their size.

Both are suitable equipment for giant transports on ocean routes as well as for the military crafts for which they were developed. They are equally suitable for use on surface vessels. The Wheel is large enough so that 104 men in the water can cling to it; the Wagon keeps 20 men comfortable and dry.

They are made of rubber, and when packaged for storage in a plane or on ship deck require little space, not much more than a large suitcase. They are the types that automatically inflate themselves with carbon dioxide gas from attached pressure tanks when released from their packaging.

The Wheel resembles a large doughnut with two cross tubes all inflated with the gas. Ropes are attached to all tubes for survivors in the water to grasp. The raft is a temporary means of survival until boats can come to the rescue.

The Covered Wagon is boat-shaped but has a large canopy to protect its occupants from sun and storms. It is a rubber raft with side walls, and inflated seats around the sides provide comfort for the men in it and insulate them from coldness of the water below. The arched supports for the canopy are inflated rubber tubes. Attachments are available for mounting an outboard motor. The raft and canopy weigh 178 pounds, and when in storage make a package less than three feet long and about two feet square.

Science News Letter, July 27, 1946

MICROGRAPHY

Crystal Structure of Molecules Studied

➤ A NEW LOOK has been obtained into the basic molecular structure of the crystals of disease viruses. Electron microscope photographs of 26,000 times magnification taken at the National Institute of Health show the molecules themselves perched upon the face of a virus crystal in a regular arrangement.

One of the unsolved problems in studying these disease-causing viruses is the structure of their crystals. Once scientists know how the molecule particles array themselves within the crystal they will have one more hint as to how to proceed in fighting the virus itself in the human, animal or plant that it makes ill.

Two U. S. Public Health Service scientists, Dr. W. C. Price, also with the University of Pittsburgh, and Dr. Ralph W. G. Wyckoff, have just published scientifically in the London journal, *Nature* (June 8), actual electron microphotographs of the molecules spotted in regular array on the face of a crystal of bean mosaic virus.

The next step after this exploration will be to apply the new method to protein and other large molecule substances. This new way of reaching down into the minutely small structure of matter thus promises to give science a new probe into the fundamental process of living matter.

Science News Letter, July 27, 1946

WILDLIFE

Duck and Goose Decline Reported as Serious

➤ A DUCK'S LIFE is a hard one, and the prospects are that it will get harder.

Hunters' shots, disease and drought in the northern breeding grounds have cut the duck and goose population of the United States by 36% in two years. Meanwhile, the number of hunters has increased more than half a million, with 1,686,368 gun-carrying enemies searching for the remaining 80,000,000 wildfowl.

Officials of the U. S. Fish and Wildlife Service term the situation "serious," and their latest field reports indicate that the duck decline has hit all regions and all species.

The answer, they declare, is shorter seasons for hunters or smaller bag limits or both.

While many of today's hunters were in the Armed Forces aiming at Nazis and Japs, the wildfowl census reached a peak in 1944 with an estimated 125,350,000 birds. But peacetime guns are being aimed at an already diminishing number of ducks and geese.

Science News Letter, July 27, 1946

AERONAUTICS

Long Range Altimeter Aids in Blind Flying

➤ PLANES won't be likely to crash into skyscrapers when using a new type of long-range radio altimeter, now being installed in transport planes. It gives the plane's height in feet above the earth or any obstacle below.

Although not designed to detect a building ahead as radar might, the altimeter enables the pilot to maintain safe altitudes when sudden changes in reading indicate he is flying over a city with many towering buildings. The instrument is especially valuable in facilitating blind landings, since it gives the exact altitude continuously within a few feet, from ground level up to 400 feet.

The present instrument, using a high frequency radio transmitter and receiver, was adapted from similar equipment developed for the Army Air Forces during the war. It automatically computes the exact distance to the terrain directly below by gauging the time needed for short signals beamed from the instrument to be reflected back.

Science News Letter, July 27, 1946

ASTRONOMY

Three Planets Visible

Three planets can be viewed during August. In order of their brightness they are Venus, Jupiter and Mars. The brightest star on August evenings is Vega.

By JAMES STOKLEY

➤ GONE FROM the evening sky of August is the brilliant display of planets that we enjoyed during the late spring, but three can still be seen in the early evening. Only one of them, Jupiter, remains up long enough to get a place on the accompanying maps, in which the heavens are depicted for 10:00 p.m., standard time, on Aug. 1, and an hour earlier in the middle of the month.

These three planets are all in the constellation of Virgo, the virgin. Venus is the brightest of the trio, about 18 degrees above the horizon at the time the sun sets. With magnitude minus 3.8, it is the first to appear. Next in brightness (of magnitude minus 1.4), and farther to the south, is Jupiter. Mars is considerably fainter, equal only to a second magnitude star. All three planets are somewhat dimmed by reason of their proximity to the horizon, an effect of the greater thickness of air which their light has to penetrate on the way to us.

At the first of August, Venus will be lower than Mars, but Venus moves faster, and on Aug. 9 she passes her fainter brother, at a distance of apparently only a little more than the diameter of the moon. The close approach, however, takes place in the morning, at an hour when they are not visible from this part of the world. The night before, as well as that of the 9th, will show them very close. Not until Sept. 3 will Venus pass Jupiter.

The other two naked-eye planets have both passed into the morning sky. Mercury, in line with the sun, is behind it on Aug. 2, and by the 20th it will reach its position farthest west of the sun. Then it will be seen low in the east before sunrise. Saturn passed behind the sun in July, and is now in the constellation of Cancer, the crab, which rises an hour or so before the sun.

Almost directly overhead, in the constellation of Lyra, the lyre, we now see Vega, brightest of the August evening stars. Second brightest is Arcturus, toward the west, in Bootes, the bear-driver. Then comes Altair, high in the south, part of Aquila, the eagle. Fourth is Antares, distinctly red in color, which is easily located in Scorpius, the scorpion, low in the south. Directly east of Vega is Cygnus, the swan, and in the figure we find Deneb, the fifth of the stars of the first magnitude visible these evenings.

Milky Way Prominent

At this time of year the Milky Way—Milton's "broad and ample road whose path is gold and pavement stars"—comes into its best position. It is hard to see in competition with city lights, but from the country, on a dark, moonless night, it can well be appreciated, extending from the northeastern horizon, upwards through Cassiopeia, Cepheus, and down to the south through Cygnus, Aquila and Sagittarius. Though it looks to the naked eye as a continuous path of light, through a telescope, or even a good pair of binoculars, one can see, as Galileo did in 1610, that it is a swarm of stars.

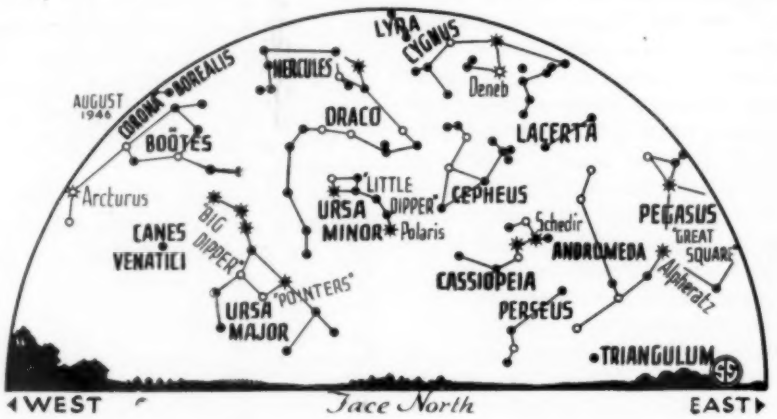
It was much later that astronomers began to understand the Milky Way and the relation of the sun and other stars to it. This was done by statistical methods, which ignore individual differences among the stars. They vary greatly in their intrinsic brightness, or candlepower, so when you see a faint star in the sky it may be a bright star far away—or a really faint one that is much closer. However, when considering large numbers of stars, the individual differences iron out, and we can justifiably assume that the fainter a star appears, the farther away it is.

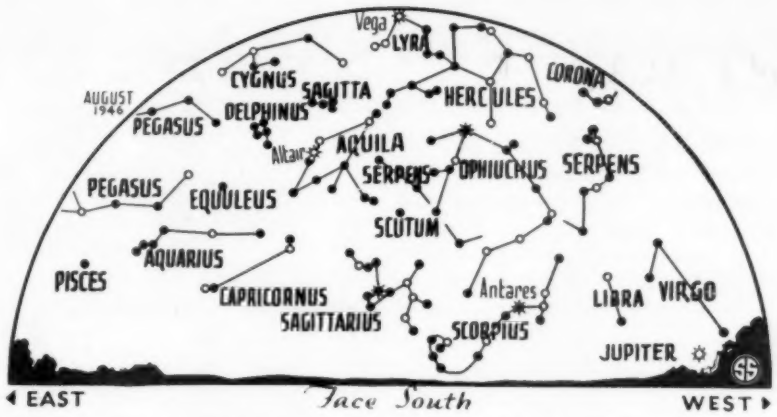
Astronomers classify stars according to their brightness by magnitude and, neglecting differences of individual stars, the average one of the third magnitude is about 1.6 times as far as the average second magnitude star. Thus, every time we go from one magnitude to the next fainter, we reach out 1.6 times as far into space—that is, we are observing a spherical volume of space that much greater in radius. This extra distance of 1.6 times means that we observe about four times the volume. Consequently, if the stars are uniformly distributed, there ought to be four times as many third magnitude stars as those of the second, four times as many of the fourth as of the third, and so on.

Counting the Stars

Some two centuries ago astronomers began to make such counts, of selected sample areas of the sky. There are a total of 40 stars of the first and second magnitudes, and 135 when we include also those of the third. Thus the ratio between two and three is 3.4, not far from the figure of four. There are 4800 stars down to the sixth magnitude, faintest visible to the naked eye, and 15,000 down to the seventh, so here the ratio between magnitudes is only 3.1. The largest telescope will detect stars down to the 20th magnitude, and there are about 1,000,000,000 that are as bright or brighter than this. As there are some 560,000,000 stars down to the 19th magnitude, the ratio, between 19 and 20, is only 1.7, which shows that the farther away we get, the more thinly the stars are distributed.

If we could observe down to the 29th magnitude, we could detect a total of





☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

about 100,000,000,000 stars and then the ratio would drop to one. That is, a further increase to reveal stars of magnitude 30 would not show any more. Then we would have reached the end of our stellar system.

Not only do such counts tell us that the stars are confined to a limited system—they can also tell us its shape. Among the naked-eye stars there are about four times as many in a given area toward the Milky Way as in other directions. For stars of the 20th magnitude they are about 44 times as numerous, so this indicates that in the direction of the Milky Way we could go much farther before coming to the end. The whole system, which we call the Galaxy, thus has the shape of a vast grindstone, of such a diameter that light, traveling 186,000 miles a second, takes about 100,000 years to cross it. We are out quite a distance from the center, toward the constellation of Sagittarius, which we now see in the south, and that is why the Milky Way is so bright in that direction.

Millions of Galaxies

But although these stars of our own system are limited, there are millions of other such systems—other galaxies— out beyond the borders of ours. One of the nearest can be seen with the naked eye as a hazy spot of light in the constellation of Andromeda. The light from this takes about 700,000 years to reach us. With the 100-inch telescope at the Mt. Wilson Observatory, still the world's largest, galaxies have been detected which are so distant that their light spends about 500,000,000 years on its way to us. The 200-inch instrument, nearing completion on Mt. Palomar, will reach out about twice as far, and it is in the observation of these distant objects that this new astronomical eye will find one of its most important tasks.

Celestial Time Table for August

Aug.	EST	
2	10:00 a.m.	Mercury in line with sun
	7:53 p.m.	Moon passes Jupiter
4	3:55 p.m.	Moon in first quarter
6	7:00 p.m.	Moon farthest, distance 251,300 miles
9	9:00 a.m.	Venus passes Mars
12	Early a.m.	Meteors of Perseid shower visible
	5:26 p.m.	Full moon
19	8:17 p.m.	Moon in last quarter
20	3:00 p.m.	Mercury farthest west of sun
22	5:00 a.m.	Moon nearest, distance 229,000 miles
24	10:59 a.m.	Moon passes Saturn
25	5:44 a.m.	Moon passes Mercury
26	4:07 p.m.	New moon
29	12:38 p.m.	Moon passes Mars
30	5:35 a.m.	Moon passes Venus
	1:06 p.m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three for PST. Add one hour for the corresponding Daylight Saving time.

Science News Letter, July 27, 1946

SURGERY

Surgery Aids Cancer Of Prostate Gland

➤ CHANCES OF one kind of cancer patients surviving five years, the customary period for appraising results of cancer treatment, have been increased from 14.1% to 20%, it appears from a report of Dr. Charles Huggins of the University of Chicago (*Journal of the American Medical Association*, June 15).

The patients Dr. Huggins reported were all elderly men with cancer of the prostate gland. The treatment was surgical removal of the sex glands.

Of the 21 patients operated on five years ago, one died of pneumonia within eight days of the operation. One is alive but has a slowly advancing prostatic cancer. Four, including one man who was 71 years old and dying at the time of operation, are now alive and well with no clinical or laboratory evidence of cancer.

Reports quoted by Dr. Huggins of other methods of treating this kind of cancer show that the highest five-year survival rate was 14.1%, with some as low as 1.3%.

In spite of general acceptance of five years without recurrence as a cure for cancer, Dr. Huggins states that it is premature to suggest that any of his patients has been cured.

The effectiveness of the operation is apparently dependent on whether the cancer is dependent on male sex hormones and whether the sex glands are contributing functionally significant amounts of the total production of these.

The 15 patients who did not survive the five-year period lived from three and one-half to 63 months after the operation.

Among the five-year survivors, signs of spread of the cancer to the bones are either absent or equivocal, although all had signs of bone cancer at the time of the operation.

Science News Letter, July 27, 1946

PHOTOGRAPHY

Timing Devices Make X-ray Photography Safe

➤ X-RAY PHOTOGRAPHY has had its guess-work removed by two timing devices on which U. S. patents have just been issued to a pair of Chicago inventors, Russell H. Morgan and Paul C. Hodges.

The first device consists of a photocell with suitable electrical hookup to swing a pointer over a graduated scale. A trial "shot" of X-rays is sent through the subject onto the photocell; their remaining intensity determines the amount of current and hence the swing of the pointer. The scale is graduated directly in seconds needed for proper exposure of the film.

The second device improves on the first, in that a preliminary "shot" is not necessary. The photocell receives the X-rays after they have passed through both the subject and the photographic film. Current from the photocell, instead of moving a pointer, builds up a charge on a condenser. When it reaches a predetermined level it acts through a thyratron-controlled relay to break the X-ray circuit and end the exposure. The whole operation is automatic; the roentgenologist does not even need to know what the proper exposure time is.

Rights in both patents, Nos. 2,401,228 and 2,401,229, are assigned to the United States of America, as represented by the Director of the Office of Scientific Research and Development.

Science News Letter, July 27, 1946

Do You Know?

Rats on farms are costly; three of them will eat daily as much as two hens.

Cod-liver oil as a possible substitute for linseed oil in paints is being investigated in Norway.

The excess of *births over deaths* in the United States during 1945 indicates a population increase of 154 per hour.

New *action mechanism* in pianos is now constructed of magnesium and plastic materials; substituting magnesium for wood parts eliminates warping.

The *Big Dipper* swings completely around the North Star in 24 hours; the different positions of the Dipper in the sky during different seasons are due to stars rising earlier each day.

Fluorescent light tubes have proved superior to ordinary electric lights in luring Clear Lake gnats into traps; this bothersome pest, which breeds in enormous numbers, takes its name from the Clear Lake region of California.

Wood-waste utilization is a subject of special research at the University of New Hampshire; work is concentrated on plastics from sawdust, the use of lignin in plant-growing, and wood-yeast feeds for cattle and poultry.

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MEDICINE

New Approach to Checking Spread of Polio

➤ A NEW SLANT on how infantile paralysis spreads and a possible new approach to methods of checking its spread appeared in a report by Dr. Thomas Rivers of the Hospital of the Rockefeller Institute, New York, at the meeting of the American Medical Association in San Francisco.

Scrupulous personal cleanliness on the part of every one as well as care to protect food, milk and drinking water from flies would be the weapons for preventing the spread of polio, it appears from Dr. Rivers' report. With many other scientists, he believes that the infantile paralysis virus leaves the bodies of patients and healthy carriers in intestinal wastes, medically termed feces. Contact with the virus from this source, he believes, is how the next person gets infected.

Experience while serving with a Naval medical research unit on Guam during the war showed Dr. Rivers how easily the polio virus or other germs leaving the body in feces can spread.

The problem on Guam was hookworm, not infantile paralysis. But it convinced Dr. Rivers that "many persons and their clothes are invisibly but dangerously contaminated with feces.

"From a small cotton blanket on which an infant with hookworm had rested for 24 hours and which showed no visible evidence of fecal contamination, 20,000 infective hookworm larvae were obtained after the blanket had been kept in a moist condition for five days," Dr. Rivers reported.

The evidence from this apparently clean but bacteriologically dirty blanket helped the Navy doctors check hookworm. It may furnish a better weapon for fighting the spread of polio.

Flies may spread the polio virus as they carry typhoid fever germs. Dr. Rivers, however, does not think they play a major role in infantile paralysis. He debunked the idea of controlling polio by DDT sprayed from airplanes.

Spraying DDT from airplanes to kill flies to control infantile paralysis, he said, would do about as much good as spraying soapy water from planes for personal cleanliness.

Science News Letter, July 27, 1946

POTATO SEEDS—These potato balls look so much like miniature green tomatoes that when they appear in somebody's garden they usually start an excited report of a potato-tomato hybrid. Actually they are only the normal seed-containing fruit of the potato plant, as shown in this U. S. Department of Agriculture photograph, and are noteworthy only because of their rarity. Luther Burbank started his career by planting the seeds from some of these potato balls, and the one good plant that came up out of the crop became the famous Burbank potato.

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3021-Q	Amici Roof Prism (3rd grade)	.25 each
523-Q	Six Threaded Metal Reticle Cells	.25
624-Q	Neutral Ray Filter size 4¾" x 2½"	.25
3022-Q	Round Wedge 65 mm. dia.	5.00 each
16-Q	Level Vial, 48 mm. long	.20 each
1040-Q	6 Power Magnifier—diam. 25 mm.	.25 each
2043-Q	Standard Crossline Reticle—dia. 29 mm.	.50 each
1034-Q	Burning Glass Lens	.25 each
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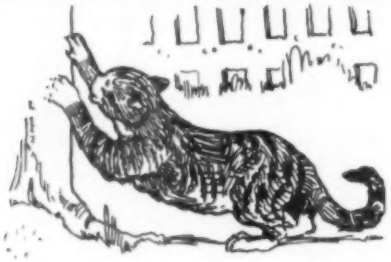
ZOOLOGY

NATURE RAMBLINGS

by Frank Thone



Tame or Familiar?

➤ FREQUENTLY we hear of a person living on the farm or in the woods who has "tamed" some wild animal not usually kept as a pet, like a porcupine, or a groundhog, or a skunk, or even a toad. We may also hear of animals in a given locality being so "tame" that one can walk right up to them.

Both these uses of the word are somewhat inaccurate. Ordinarily timorous or cautious animals, like deer or beaver, that let you approach them should properly be called fearless. Actually, such fearlessness is the normal attitude of animals toward man unless he has given them cause to regard him as a predator, and in the same class with wolves and wildcats.

The person with a "tame" wild animal as a rule gets no further than having offerings of food accepted, or perhaps being permitted to stroke its fur or scratch its ears. This degree of intimacy is tolerated, and even apparently enjoyed, by a great variety of animals, which otherwise live their normal wilderness lives. Naturalists refer to such animals as "familiar" rather than "tame".

A step toward real tameness comes if the animal consents to share quarters with its human friend. That is an approach to what zoologists call commensalism, which merely means living in the same house. As a matter of fact, some of our supposedly domesticated animals, cats for example, though housemates of man for scores of generations, are really no tamer than that. They accept our food, affection and shelter, and give us nothing in return but their pleasant company. The same can be done with prairie-dog or armadillo, starting from scratch.

An animal may be regarded as fully tamed when it makes some tangible return to its human partner for the favors it receives, such as helping in hunting, or guarding property, or bearing burdens. Dogs illustrate this behavior phase very well, and so do horses. Some cats approach this level, but they are exceptional individuals.

Wild animals can be fully and satisfactorily tamed. Wild horses, after proper handling, become good saddle and draft animals. Wild elephants are constantly being rounded up in the Asiastic tropics, and live long lives of service to man. Hawks and cheetahs, the very symbols of fierce independence, are captured and tamed into excellent hunting servants.

There is thus no question of the tamability of wild animals; only, before we call an animal tame we should be sure its behavior towards man qualifies it for that title.

Science News Letter, July 27, 1946

PHYSICS

Universe's Ultimate Forces Probed

➤ AN UNDERSTANDING of the ultimate forces of the universe promises to result from the hundreds of millions of electron-volts that atomic physics is about to let loose in new atom smashers.

This may be more important than the development of the atomic bomb.

Dr. Robert J. Oppenheimer, director of the Los Alamos Atomic Bomb laboratory when the bomb was first made, also predicted to the American Physical Society meeting at the University of California:

1. Fundamental revision of present theories of matter.
2. Extension of new knowledge to other fields of science.
3. Discovery of new elementary nuclear particles that will give a better picture of the atom and the principles upon which it works.

Man is now about to duplicate nature's most powerful atom-smashing, the cosmic rays that consist of protons hurtling into the earth's atmosphere from outer space, crashing into atmospheric atoms and causing birth of an atomic particle called a mesotron. It takes about 250 million electron volts to knock a mesotron out of another proton, and atom smashers are now reaching that energy and beyond.

Particles now known to be a part of an atom were listed by Dr. Oppenheimer as the electron, proton, neutron, positron, mesotron, gamma ray, and a hypothetical neutrino for which evidence has not been found.

Science News Letter, July 27, 1946

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• Books of the Week •

ASTRONOMY: A Textbook for University and College Students—Robert H. Baker—*Van Nostrand,* 461 p., tables and illus., $4., 4th ed. For use in introductory courses requiring no special preparation in mathematics and physics. This 4th ed. contains a brief treatment of celestial navigation, and results of recent inquiries in astronomy.

CHECKLIST OF THE COLEOPTEROUS INSECTS OF MEXICO, CENTRAL AMERICA, THE WEST INDIES, AND SOUTH AMERICA: Part 4—Richard E. Blackwelder—*Smithsonian Institution,* 763 p., paper, 50 cents. United States National Museum, Bull. 185.

CHEMISTRY AND HUMAN AFFAIRS—William E. Price and George H. Bruce—*World Book Co.,* 788 p., illus. and diagrs., $2.68. A textbook implementing a general high-school chemistry course, with broadly cultural as well as utilitarian value.

ELECTRONICS IN INDUSTRY—George M. Chute—*McGraw-Hill,* 461 p., illus. and diagrs., $5. A broad introduction to the use of electronic circuits and equipment, outlining the industrial uses of tube circuits and giving detailed explanations of a large number of electronic equipments now serving in industrial plants.

FOOD CONSUMPTION LEVELS IN THE UNITED STATES, CANADA, AND THE UNITED KINGDOM—*Government Printing Office,* 58 p., tables, paper, 15 cents. Third report of a Special Joint Committee set up by the Combined Food Board.

HIWASSEE ISLAND: An Archaeological Account of Four Tennessee Indian Peoples—Thomas M. N. Lewis and Madeline Kneberg—*Univ. of Tennessee Press,* 311 p., tables, illus. and maps, paper, $5.50. The story, representing nearly two years of large scale excavation, of the prehistoric people who successively inhabited one of the largest islands in the Tennessee River.

AN INTRODUCTION TO BOTANY—Arthur W. Haupt—*McGraw-Hill,* 425 p., illus., $3.50, 2nd ed. A textbook intended to introduce the college student to the science of plant life, and attempting to lay the foundation for further studies, rather than treat the subject exhaustively.

OUR FAR EASTERN RECORD: The War Years—Shirley Jenkins—*Institute of Pacific Relations,* 96 p., paper, 25 cents. The third pamphlet in a series of documentary studies of American Far Eastern policy, attempting to answer questions regarding the nature of our Far Eastern Policy.

PERMIAN FUSULINIDS OF CALIFORNIA—M. L. Thompson, Harry E. Wheeler, John C. Hazzard—*Geological Society of America,* 77 p., maps and illus., $1.25. Geological Society of America, Memoir 17.

PROBLEMS IN THE IMPROVEMENT OF READING—Constance M. McCullough, Ruth M. Strang, Arthur E. Traxler—*McGraw-Hill,* 406 p., tables, $3.50. A book to aid teachers and administrators in solving the reading problems which they encounter in their schools, ranging in scope from the elementary schools to adult education.

RACIAL MYTHS—Mary Ellen O'Hanlon, O. P.—*Rosary College,* 32 p., paper, 25 cents. A scientific examination of some of the erroneous ideas and prejudicial theories so detrimental to social and interracial justice.

RADAR: What It Is—John F. Rider and G. C. Baxter Rowe—*Rider,* 72 p., illus. and diagrs., paper, $1. A complete, non-technical explanation of the principles of radar, of its applications, and of its various uses by the Armed Forces.

A VEGETABLE GARDENER'S HANDBOOK ON INSECTS AND DISEASES — *Government Printing Office,* 30 p., illus., paper, 15 cents. An aid to the gardener in identifying the more common insects and related forms and the more common diseases that attack vegetable gardens in the U. S., and in providing him with simple directions for the control of these pests.

X-RAYS IN PRACTICE—Wayne T. Sproull—*McGraw-Hill,* 615 p., tables and illus., $6. A comprehensive treatment, giving the reader a broad understanding of X-rays, their nature, and the many purposes for which they may be used.

Science News Letter, July 27, 1946

RADIO

Next: "Reading by Radio"

► FACSIMILE radio receivers will soon join ordinary receivers and television sets in the modern "radio" home. They will provide exact copies of letter-sized, four-column news sheets put on the air at frequent intervals by special broadcasting stations.

Facsimile transmission of pictures, charts, printed pages and letters by radio is not new, but improved transmitting method and receiving equipment now make the procedure more practical. The installation of receivers in homes is dependent upon the erection of broadcasting stations to put the printed news on the air. One such station has been completed in New York, and six others elsewhere will follow soon.

This first is FM-Facsimile broadcasting station WGHF, of Finch Telecommunications. Successful demonstrations have recently been made in transmitting the letter-size newspaper, at the rate of 500 words a minute, to receiving sets in the city, and to others on moving passenger trains and soaring airplanes.

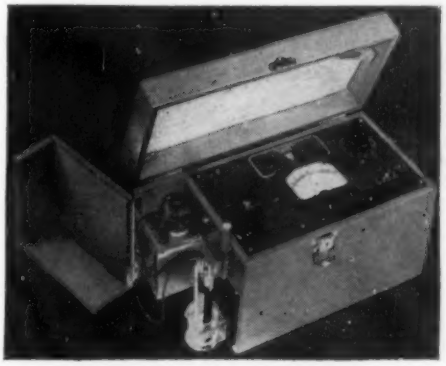
Similar facsimile transmission may have many other uses. The approach of vessels below New York harbor is now being reported by Radio-Telefax equipment installed on pilot boats. One bank will soon use facsimile transmission to send copies of checks presented for cashing to a central office to identify the signature.

The facsimile transmitter is a scanning machine with a spinning cylinder about which the copy to be sent is wrapped. A sharp point of light traces a closely spaced spiral line on the surface of the paper, and causes the lights and darks of the copy, made by print or pictures, to be reflected with varying intensity upon a photoelectric cell.

The electric currents from the cell caused by the varying light are converted into radio waves by special equipment in the broadcasting apparatus. These waves are received on a cylinder in the receiver, spinning at identically the same speed as the transmitter cylinder. They pass through sensitized paper, leaving an exact copy of the original.

Science News Letter, July 27, 1946

An unusual thing about the *white stork* is that for ages longer than recorded history it has built its nest on roofs or close to human habitations.



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•New Machines And Gadgets•

❁ *GASOLINE blow torch in combination with a removable soldering iron, developed in Germany, has a burner head of common design, a fuel tank inside its handle, and a pump within the tank. The soldering copper is fastened to the top of the torch and is held in the flame.*

Science News Letter, July 27, 1946

❁ *FIBER-METAL package for frozen foods eliminates the inner sealed bag or outer wrap. It has metal ends easily removable with an ordinary hook-type opener. The walls are of paraffin-impregnated fiber, and the whole is semi-rigid in construction.*

Science News Letter, July 27, 1946

❁ *PLASTIC SHOES for women, recently patented, have their soles, instep supports and elevated heels in a single molded piece. Fabrics, preferably in the form of ribbons, pass around the foot and ankle. The plastic used may be transparent or colored.*

Science News Letter, July 27, 1946

❁ *FACSIMILE equipment just installed in a New York bank facilitates the cashing of checks. The machine sends an exact picture of any check over a telephone wire to the bank's central signature file for verification. A report is received in about one minute.*

Science News Letter, July 27, 1946

❁ *NEW TYPE syringe, greatly simplifies the technique of administering penicillin as it makes possible the use of a one-shot cartridge containing a 24-hour dose. The low cost of making the*

plastic device shown in the picture permits disposal of the syringe after a single use.

Science News Letter, July 27, 1946

❁ *AIR FILTER in railroad passenger cars contains activated carbon through which the air in the car is circulated. It will eliminate by adsorption odors from smoking, food, drink, and even from passengers themselves. The equipment requires relatively little space.*

Science News Letter, July 27, 1946

❁ *MOISTURE REMOVER, to dry air passing through compressed air lines, is a cylindrical chamber with a perforated hollow structure projecting inside from the air-outlet end. This is filled with steel wool surrounded by felt. The air inlet is on one side of the cylindrical chamber.*

Science News Letter, July 27, 1946

❁ *TANK for keeping fish fresh, as caught or after cleaning, preserves by replacing much of the air with oxygen after the fish are packed. The tank, with oxygen constituting 35% or more of the pressurized gaseous content, is hermetically sealed.*

Science News Letter, July 27, 1946

❁ *BOTTLE CARRIER for corrosive and staining chemicals is cushioned with material that is acid, caustic and corrosion resistant, and is designed to decrease bottle breakage in handling or transporting. Bottles are completely enclosed within the carrier by pulling a draw string at top.*

Science News Letter, July 27, 1946

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Question Box

AERONAUTICS

What are the features of the new Army flight suit for supersonic flying? p. 53.

ARCHAEOLOGY

How many giant heads have been excavated recently in Mexico? p. 52.

ASTRONOMY

What are the only three planets visible during August? p. 58.

Who is the French astronomer who is visiting this country for the purpose of comparing observations of the sun at the various observatories? p. 56.

ENGINEERING

What principle of safety applies to both airplanes and suspension bridges? p. 55.

What method is being used in place of the noisy air hammer to cut concrete and steel? p. 56.

ENTOMOLOGY

What steps will probably be taken to preserve wild ducks in this country? p. 57.

MEDICINE

How are unborn babies to be cured of syphilis? p. 54.

What steps may be taken to check the spread of infantile paralysis? p. 60.

PHYSICS

Which of nature's forces is now to be probed with the new cyclotron? p. 62.

PUBLIC HEALTH

What are some of the serious problems facing the World Health Organization? p. 53.

ZOOLOGY

What is the natural attitude of wild animals toward man? p. 62.

Where published sources are used they are cited.

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